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SPACE CENTER Roundup

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X-38 team flies largest parafoil parachute in history

A team developing a prototype International Space Station "lifeboat" called the X-38 Crew Return Vehicle successfully flew the world's largest parafoil parachute last month at the U.S. Army's Yuma Proving Ground in Arizona. They released a parachute with an area almost one and a half times as big as the wings of a Boeing 747 jumbo jet.

The unmanned January 19 parafoil test was part of the development of a re-entry system for the X-38 spacecraft. The parafoil recently tested in Arizona has a span of 143 feet and a total surface area of 7,500 square feet, making it the largest successful parafoil in the world.

"I think this is a world's record for a parafoil and it is a significant milestone and accomplishment for NASA," said John Muratore, who is leading the X-38 Crew Return Vehicle Project. "It puts us a major step closer toward our goal of providing the space station with the most flexible crew return option. This parafoil has the size and all the features to enable it to be used for returning humans from space."

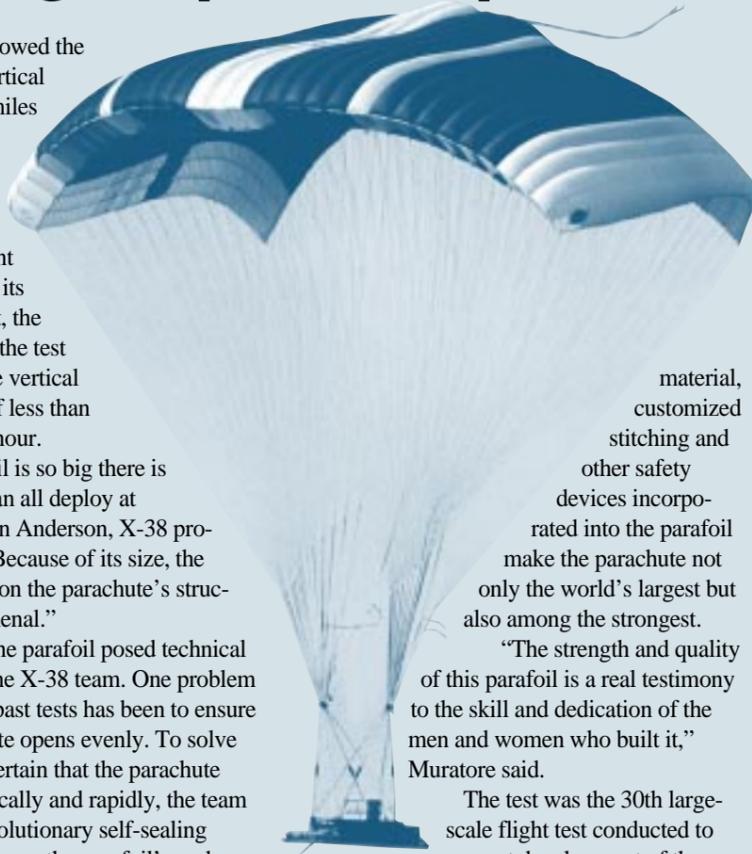
For the test, an 18,000-pound pallet, simulating the actual X-38, was dropped from the back of a C-130 aircraft at an altitude of 21,500 feet. A 28-foot diameter extraction parachute pulled the test platform from the aircraft at an air speed of 130 miles per hour to begin the flight test. Once out of the aircraft, a newly designed 80-foot diameter drogue parachute

stabilized and slowed the platform to a vertical airspeed of 62 miles per hour and enabled the parafoil to begin a five-stage deployment process. During its 11-minute flight, the parafoil slowed the test pallet to a gentle vertical landing speed of less than eight miles per hour.

"This parafoil is so big there is no way that it can all deploy at once," said Brian Anderson, X-38 project manager. "Because of its size, the dynamic forces on the parachute's structure are phenomenal."

The size of the parafoil posed technical challenges for the X-38 team. One problem encountered in past tests has been to ensure that the parachute opens evenly. To solve this and make certain that the parachute opens symmetrically and rapidly, the team developed a revolutionary self-sealing floor vent system on the parafoil's underside. During the recent test, the parafoil opened to its full size in only 30 seconds.

The parafoil was stitched together at Pioneer Aerospace's facility in Columbus, MS. Because of its unprecedented size and strength, personnel at Pioneer nicknamed the parafoil "Sampson." A unique ripstop nylon



material, customized stitching and other safety devices incorporated into the parafoil make the parachute not only the world's largest but also among the strongest.

"The strength and quality of this parafoil is a real testimony to the skill and dedication of the men and women who built it," Muratore said.

The test was the 30th large-scale flight test conducted to support development of the parafoil, although this was the largest and most comprehensive test to date. In addition to tests at Yuma, four large-scale atmospheric flight tests of prototype X-38 vehicles have been completed at NASA's Dryden Flight Research Center using a smaller 5,500-square-foot parafoil. For those tests, increasingly complex X-38 vehicles have

been launched from a B-52 carrier aircraft at increasingly higher altitudes. More such tests are planned during the next year and a half, leading up to a space flight test of the X-38 in 2002, when an unmanned vehicle now under construction at JSC will be released in orbit by the space shuttle to fly back to Earth.

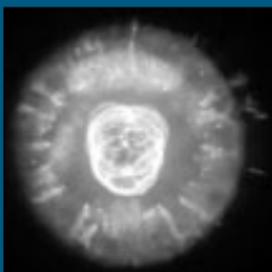
The X-38's design is called a lifting body. Unlike the space shuttle, it does not have wings. All of the lift necessary to maneuver and fly the X-38 comes from the lift generated by the flow of air over the body of the spacecraft and its fins. Lifting body configurations were studied extensively in the 1960s and 1970s as space entry vehicles. These vehicles all had very high landing speeds that proved difficult to control. The combination of the lifting body for the high-speed part of entry followed by the parafoil for the final landing has proven to be a winner in the X-38 project.

The large-scale drops of the parafoil were supplemented with more than 300 subscale drops.

"The subscale drops gave us the opportunity to test and refine techniques and gain the experience we needed for the large-scale drops at a much lower cost," said Jenny Stein, project lead for the X-38 parachute systems. The 7,500-square-foot parafoil will be tested at Yuma again this spring and will then be integrated with one of the X-38 vehicles at Dryden for a test flight there late this year. ■



Yuma Proving Ground photos by William Isbell



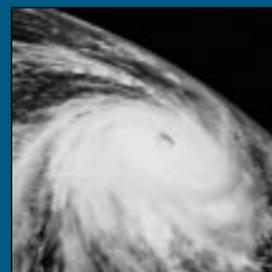
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Distance Learning and Education Project expands

More students and teachers can interact with real space scientists, engineers and astronauts than ever before thanks to JSC's expanding Distance Learning and Education Project.

The concept of distance learning originated years ago with school correspondence courses. Soon, organizations such as city zoos, museums and NASA also began to share their resources with academia. However, during the past few years technology has removed the remaining barriers and distance learning has experienced a dramatic spike in popularity.

The increased capabilities of distance learning around the world prompted JSC Center Director George Abbey to support a new team within public affairs called the Distance Learning and Education Projects Office to manage the increasing opportunities to share the excitement of NASA and JSC with school groups.

Some organizations in JSC have been doing their own versions of distance learning and outreach for many years by giving virtual tours or hosting chat sessions. This new office, led by Susan Anderson, will act as an umbrella for those activities by referring educators to the appropriate program for the type of learning event that fits their needs and ensuring that the activities are tracked and measured.

"The project's vision is to entice students to investigate the possibilities of applied sciences by distributing NASA-related training, education, and inspirational opportunities through distance learning technology," said Anderson. "We're trying to offer teachers not only motivational and inspirational tools, but also provide them with a different way to educate students, not just in math and science – but interdisciplinary aspects, including history or sociology. There are some very good lessons that we can reinforce for these topics as well."

She says the goals for the new distance learning initiative are to expand and upgrade the DLEP events; improve Web site usability; increase university and institutional partnerships worldwide; and expand the resources for employee



NASA JSC Photo JSC2000-00278

The Distance Learning and Education Project team brings the human space flight program to life in classrooms around the world. The team includes, back row, left to right, Erika Guillory, Sarah Enticknap, Timothy Reynolds, Desmond Anthony and Sharon Hosea, and front row, Susan Anderson, Bob Fitzmaurice, and Emmett Durham.

development and supplement crew training. She also wants to build reciprocal agreements with contractor organizations.

To that end, one of the initial objectives the team is working on is developing interactive subject-based education modules to supplement the distance learning sessions currently offered. This not only will help the educators maximize the interactive experience, but help ensure the students absorb consistent, valuable education messages and allow JSC to accurately measure and track the effectiveness of its distance learning events.

Emmett Durham, Indyne, Inc., senior instructional systems designer for the

program, says he uses a systematic approach to creating the modules – first identifying the instructional goals and then identifying the learning objectives needed to reach those goals.

"We can use this interactive opportunity to turn the students on to science and space," said Durham. "If we can get them excited about space and show them how cool it is, perhaps more students will find they like it after all and will pursue math and science as a career."

The modules include life science, Earth science, space life science, geography and microgravity, and are developed in accordance with national

education standards. Each module includes background lessons to prepare the students for the interactive event. And because student learning abilities vary according to age, each module has age-appropriate versions for various grade levels. The team is already using the microgravity lessons and the remaining modules will be complete for the 2000-2001 school year.

Anderson said she hopes to establish distance learning partners in each of the 50 states, as well as reach schools in other countries, such as Department of Defense sites abroad.

"The proliferation of technology is changing the way we teach our children," said Anderson. "I really believe you are going to start seeing less and less of the standard classrooms."

Although the initial goals of the new Distance Learning and Education Project focus on facilitating education for outside entities, part of Anderson's role is assessing how these same educational tools can benefit JSC employees.

"Just-in-time training will become a natural process for our on-board crews," said Anderson. "Basic training via DLE will be the next progression for international astronaut training, and NASA and contractors will eventually have easy access to university courses via live video teleconference capabilities and the use of Web-casting."

That's a very attractive prospect for JSC employees, but first the team needs volunteers to help out with the growing requests for DLE activities. If you have a specific area of expertise and are interested in becoming a distance learning instructor, please contact Sarah Enticknap at x47325 for information on training.

NASA and contractor employees can volunteer to be on-camera hosts for DLE events. Those who volunteer will participate in two half days of training: *Delivering Your Message Live!* and *You're on Camera, Now What?* The DLE office will provide the materials, objectives and a proposed script, which hosts can customize to fit their own style. Volunteers will be limited to four hours of DLE support activities per month. ■

Hubble opens new eyes on universe

NASA's Hubble Space Telescope is back in business, as made dramatically evident in stunning new celestial pictures of remote galaxies and a colorful dying star released recently.

The images were taken last month as part of the activities to recommission the Earth-orbiting telescope.

The pictures are a culmination of the successful space shuttle servicing mission STS-103 last December, which restored NASA's premier optical space observatory to full capability beefed-up with new electronics and critically needed replacement gyroscopes. Hubble has now resumed probing the universe's many mysteries with a crystal-clear view.

"Thanks to the great work by the astronauts, Hubble is better than new," said Dr. Ed Weiler, NASA associate administrator for space science. "I think there is no better proof than these pictures that NASA's capability to send humans into space

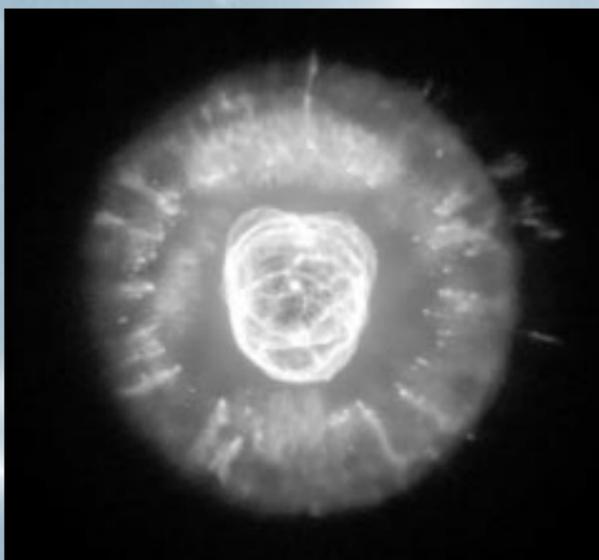
to work on Hubble has had a vital role in space science and the renaissance in astronomy we're now seeing."

To verify the telescope's refurbishment, astronomers resumed operations by aiming it at two scientifically intriguing and photogenic celestial targets.

One object is an intricate structure of shells and streamers of gas around a dying sun-like star 5,000 light-years away. Designated NGC 2392, it is dubbed the "Eskimo Nebula" because, as seen through ground-based telescopes, it resembles a face inside a furry parka. In Hubble's sharp view, the "furry" features resemble giant comets all pointing away from the central star, like the spokes of a wheel.

A second target is a massive cluster of galaxies called Abell 2218, which acts like a giant zoom lens in space. The gravitational field of the cluster magnifies the light of more distant galaxies far behind it, providing a deep probe of the very distant universe. The cluster was imaged in full color, providing astronomers with a spectacular and unique new view of the early universe.

Spacecraft operators report that all the new equipment installed on the telescope in December is working perfectly, including the new computer,



solid-state recorder, and fine guidance sensor. In particular the new gyroscopes are allowing Hubble to reliably point with exquisite precision at celestial objects.

Two key science instruments, the Wide Field and Planetary Camera 2 and the Space Telescope Imaging Spectrograph, are now

being used for routine science observations by astronomers worldwide to probe everything from planets, to black holes, to far flung galaxies. ■

NASA's Hubble Space Telescope captures a majestic view of a planetary nebula, the glowing remains of a dying, sun-like star. This stellar relic, first spied by William Herschel in 1787, is nicknamed the "Eskimo Nebula" (NGC 2392) because, when viewed through ground-based telescopes, it resembles a

face surrounded by a fur parka. In this Hubble telescope image, the "fur parka" is really a disk of material embellished with a ring of comet-shaped objects, with their tails streaming away from the central, dying star.

C O M M U N I T Y N E W S**Public Affairs staff wins coveted Telly Awards**

Competing against more than 11,000 other entrants, four JSC production team employees received prestigious Telly Awards for their excellence in video production and animation.

The Telly Awards, founded in 1980, are national industry awards that recognize outstanding TV and cable commercials, film and video productions. Unlike many other industry competitions, the Telly Awards judge entrants against standards of excellence, rather than judging them solely against other entrants. For that reason, the Telly has become one of the most sought-after awards in the TV, commercial and video industry.

"It's one thing to be recognized by people that you work with everyday," said Sue Garman, JSC associate director (management). "But it's an exceptional tribute when you receive recognition like this from a third party made up of the elite from your industry."

Garman, with JSC Public Affairs Director Barbara Zelon, presented the recipients with their awards at a ceremony January 19.

The Telly award recipients from JSC are Mark Baird, Dyncorp, winner in the History/Biography category for *John Glenn, An American Astronaut*; John Streeter, Indyne, Inc., finalist in the Education category for *Meet Me at the Station*; Paula Vargas, Indyne Inc., finalist in the Animation category for *Meet Me at the Station*; and Marco Zambetti, Indyne, Inc., winner in the Animation category for *ISS Animation 1998*.

The products developed by the video production team are invaluable to NASA. They frequently represent the sights and sounds of the space program that are shared with audiences around the world. The imagery, words and background music

phy video, which was developed for a Congressional audience at Glenn's going away ceremony, Baird had less than two weeks to develop the script, select all of the footage, select the music and create the voice-overs. The finished product is a

"And especially for this one, working in Glenn's quotes with the Tennyson voice-overs was challenging. Making excerpts from the poem work with the quotes from two pre-recorded press conferences took some time and experimentation. Brad

Sayles and our audio team worked wonders with the final clips I selected. The finished audio track was seamless."

Meet Me at the Station was developed for educational outreach. Streeter says that because space technology can be a complex topic for children, they incorporated animated characters, such as MC the robot, to make the space station more understandable and memorable for young viewers.

"Another goal was to use the talent we have here at JSC to make a program that looked and sounded like programs that kids are used to seeing on regular TV, so that they won't tune out," added Streeter. "I

think we succeeded. In fact, I've been told that *Meet Me at the Station* is the most requested educational video from our Media Resource Center."

"The videos we produce are intended to help our clients communicate NASA's message – whether the audience is the public or other NASA employees," said Eileen Walsh, Media Services, TV Production supervisor. "Hopefully we've given them some useful tools for getting their specific message out. There are so many creative and talented people on this team supporting this effort. They all have a great deal of pride in their work, so the peer recognition that comes with the Telly Award is especially gratifying." ■



NASA JSC Photo JSC2000-00633 by Robert Markowitz
Mark Baird, Marco Zambetti, Paula Vargas, and John Streeter are recipients of 1999 Telly Awards for excellence in video production and animation. New characters, such as MC the robot at left, have helped the production team win acclaim and students' attention.

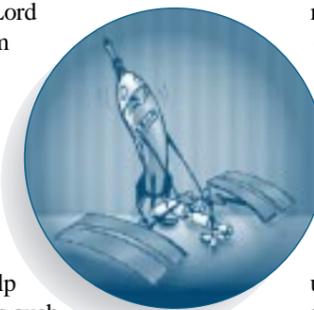
they compile can serve as footage to supplement the latest stories on the evening news, be used as an educational tool for schoolchildren or used at special events to convey the mystique, adventure and achievements of NASA.

It is estimated that footage from Zambetti's International Space Station animation tape has been used worldwide by more than 14,000 news organizations to illustrate ISS assembly and program news.

Despite the high profile of many of these video productions, the miles of footage that has to be screened and the countless hours of editing to create the end product, there isn't always a lot of time to prepare them. For the John Glenn biogra-

three-minute long tribute to Glenn's role in space exploration. Voice-overs of Alfred Lord Tennyson's poem *Ulysses*, combined with dramatic archived footage of Glenn's historic first flight and STS-95 training footage, can't help but make viewers gush with patriotism and admiration for the American hero.

"Selecting just the right clips is really difficult because you have to make it all seamless and cohesive," explained Baird.

**NASA College Scholarship Fund seeks applications**

Scholarship applications for the NASA College Scholarship Fund are due by March 31.

This fund will be awarding six scholarships of \$2,000 each. The scholarship is renewable for six years, not to exceed \$8,000. Applicants must be pursuing a course of study that will lead to an undergraduate degree in science or engineering at an accredited college or university in the United States.

Applicants must be dependents of current or retired NASA employees or dependents of former NASA employees who died while employed by NASA. Applicants must be graduated from an accredited public, private, or parochial high school or be currently enrolled in college with good academic standing. An applicant must have a combined high school grade and college (if any) grade point average of 2.5 on a 4.0 scale or the equivalent.

After meeting the minimum requirements, applicants will be ranked based on the following objective standards: (1) academic preparation, including grades, class rank, and pattern of courses; (2) school activities; (3) community activities; (4) performance on SAT or ACT; (5) written recommendations from individuals who know applicant; and (6) one-page statement of academic purpose by applicant.

Applications are available in Bldg. 1, Rm. 840 or online at the following Web site: http://hro.jsc.nasa.gov/Announce/scholarship/nasa_college_scholarship_fund.htm

Completed applications may be mailed to JSC, The NASA College Scholarship Fund, Inc.; Mail Code AH12/Scholarship Committee; Houston, TX; 77058. For additional information, contact Mary O'Connell at x35774 or Teresa Sullivan at x31034. ■

JSC to observe Black History Month

JJSC will observe Black History Month with a series of activities beginning at 11:30 a.m. February 23 - 24 in the Bldg. 3 cafeteria.

One highlight for the Black History Month Observance will be the performance of the Harambee School on February 23. The Harambee School provides an environment that contributes to a child's citizenship, as well as the student's intellectual, emotional, physical, and social development – an environment that recognizes and satisfies each child's need for security, success, and self-worth.

Another highlight of the scheduled activities will be the performance of the Salvation Army Harbor Light Choir on February 24. Through contemporary gospel and seasonal music interspersed with testimonies of faith and hope, the choir will spread its positive message to the audience. Whether performing before a group of wide-eyed children asking for autographs or for a group of professionals who offer hugs and words of encouragement after a performance, the choir touches the lives of its listeners. ■

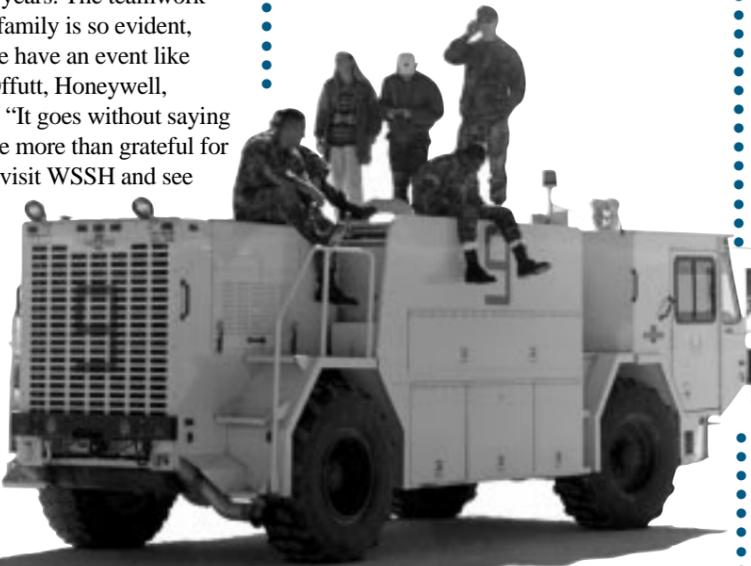
White Sands Space Harbor hosts first-ever Family Day

Imagine waving goodbye to your spouse every day for more than 20 years as he or she departs for work, yet never seeing your mate's workplace.

That has been the case for families of employees of White Sands Space Harbor in New Mexico, a branch of JSC's White Sands Test Facility for decades. But recently, WSSH opened its gates to friends and family for a first-ever Family Day event.

"I have had the pleasure of working with this group 17 years. The teamwork within the WSSH family is so evident, especially when we have an event like this," said Frank Offutt, Honeywell, WSSH supervisor. "It goes without saying that the families are more than grateful for their being able to visit WSSH and see what is done here. They'll be talking about Family Day at WSSH for a long time. We extend our thanks to everyone who supported this event."

WSSH, while unknown to many outside of its



NASA WSTF 0100-0048

these runways in top condition so having this event means a lot. It's something we'll never forget." Bernal, along with more than 155 WSSH personnel, family and special visitors spent the day touring the expansive site and meeting astronauts. A highlight of the day was a special demonstration of the STA approach 'dives' practiced routinely at WSSH. Adding to the excitement was the fact that legendary Astronaut John Young was piloting the aircraft.



Firefighters and paramedics from nearby Holloman Air Force Base are part of the team at White Sands Space Harbor. They are on standby, supporting all STA fly-ins for shuttle pilot training and were part of the crowd during Family Day.

"We always see the planes from the outside and you wonder who is on the inside flying, so this was a neat opportunity for us to get to meet some of them who are actually doing it," said Jeremy Hazel, one of five firefighter/paramedics from nearby



NASA WSTF 0100-0016

Astronaut John Young pilots the Shuttle Training Aircraft to two shuttle landing simulation "dives" as part of WSSH Family Day. Jack "Triple" Nickel and Henry Taylor also were part of the flight crew.

Fans of all ages met shuttle astronauts in person at the first-ever Family Day event. Shown at right, Astronaut William McCool signs an autograph for a youngster.

Holloman Air Force Base who support training missions at WSSH. Rescue emergency personnel from Holloman support all STA practice sessions and any landings at WSSH. "Providing safety is a job we have to do, but this is an incredible way for our management to recognize us for it."

In addition to Young, 13 other astronauts (Clayton Anderson, Dan Burbank, Laurel Clark, Bonnie Dunbar, Mike Fossum, Chris Hadfield, Rick Mastracchio, William McCool, William (Billy) Oefelein, John Olivas, Charlie Precourt, Dan Tani, and Jim Wetherbee)

attended the event, signing autographs and answering questions from the visitors.

"This is our chance to thank you all for maintaining the great runways for us to train on all the time," said Wetherbee, JSC deputy director and director of JSC Flight Crew Operations. "You can see White Sands from outer space and it's always comforting to look at. Thanks for doing all the work you do here on this side of the mountain."

Young also addressed the packed meeting room, saying, "This is the greatest landing field on the planet. You keep at it – you're the ones who have made possible the thousands of practice dives done out here and they've helped train every astronaut that's had a successful flight. We really appreciate it."

According to WSSH management, the event was very

well received and will be long remembered by the employees and visitors.

"The excitement level is going to be high for a long time after this," said Robert Mitchell, NASA WSSH manager. "The Honeywell employees at the Space Harbor are some of the most dedicated workers I have ever had the pleasure of working with in my career and to be able to give them an opportunity to shine is just the tip of the iceberg. Their efforts often go unrewarded, so it is good to be able to recognize them and their great work." ■



NASA WSTF 0100-0028

JSC Deputy Director and Director of Flight Crew Operations Jim Wetherbee entertained WSSH friends and family members with anecdotes from his shuttle mission experiences.



NASA WSTF 0100-0044



More than 155 family and friends of JSC's White Sands Space Harbor staff gathered at the 100-square-mile site to watch the Shuttle Training Aircraft demonstrate its unique ability to mimic the space shuttle landing characteristics. Guests were also treated to a tour of the facility and a luncheon with several NASA astronauts.

NASA WSTF 0100-0042

1999: U.S. experiences second warmest year on record

For the calendar year 1999, the Commerce Department's National Oceanic and Atmospheric Administration estimates that the United States experienced its second warmest year on record since 1900 with an average for 1999 of 55.7 degrees F. This follows 1998's all time record of 56.4 degrees. The values for both years exceed those of the warm decade of the 1930s. 1999 is consistent with a long-term warming trend observed in the United States (0.5 degrees C per century), with a substantial portion of the warming occurring since the mid-1970s.

NOAA expects every state except California in 1999 to be above normal and 22 states from the Rockies to Maine much above normal. Numerous records for warmth were set during certain months of the year. Temperatures for November turned out to be the warmest on record. During November, eight states from the Northwest to the Great Lakes were ranked as having the warmest November on record; 39 states were ranked as much above normal. Many cities set records for the warmest temperature ever in November; one state (South Dakota) set a state record for the warmest temperature ever recorded in the state for the month. Other heat episodes occurred during February (third warmest nationally) and during July and

August, when many locations in the Ohio Valley and eastern seaboard set monthly or all-time records for heat. The heat continued into September in the Northeast, with New England states experiencing one of the warmest Septembers on record.

Global Temperatures

Global temperatures for 1999 are expected to be the fifth warmest on record since 1880, NOAA and the World Meteorological Organization reported. Globally, the departure from the long-term average (1880-1998) was 0.42 degrees C (0.76 F).

Land temperatures continued near-record warmth (averaging 13.9 degrees C or 56.9 F; 0.79 degrees C or 1.42 F above the long-term average) second only to 1998, but ocean temperatures were the lowest since 1994. Just as the warm oceans associated with El Niño in 1998 contributed to the record high temperatures, the cooler ocean conditions in 1999 associated with La Niña helped to ameliorate what might otherwise have been an even warmer year. Although ocean temperatures were among the lowest of the past decade, they still averaged 15.5 degrees C (59.8 F) or 0.26 degrees C (0.47 F) above the long-term average.

The new data continue to confirm that the near-surface temperatures during the 20th Century rose. A long-term temperature increase of 0.06 degrees C per decade (0.11 degrees F per decade) occurred during the 20th Century. There have been two sustained periods of warming, one beginning around 1910 and ending around 1945 (approximately 0.1 degrees C per decade), and the most recent beginning about 1976. Temperatures during the latter period of warming have increased to a rate of 0.2 degrees C per decade. This is comparable to the rates of warming

projected by the Intergovernmental Panel on Climate Change to occur during this century due to anthropogenic effects.

NOAA's values for 1999 include an estimate for global temperatures for December.

Precipitation in the United States

The United States experienced a near-normal year for precipitation, with nationally averaged precipitation of 30.60 inches, which was 1.05

inches below average. Although the national value was not unusual, there were significant regional variations. The year began on a wet note in the eastern United States;

however, a dry spell that became established in April led to record-setting growing season dryness throughout the Ohio Valley and Northeast. This was the driest or second driest April-July period in all states from West Virginia to Maine. For the 12-month period from September 1998-August 1999, most of these states experienced either record or near-record dryness. The drought was followed by record-setting rainfall as two hurricanes traversed the eastern seaboard in September. States from North Carolina to Maine experienced a record or near-record wet September and numerous locations reported their heaviest 24-hour precipitation, wettest September or wettest month on record.

In the Pacific Northwest, La Niña-induced precipitation produced locally heavy rainfall totals, with locations in western Washington reporting their

wettest February and wettest year on record. Cold temperatures led to a record-setting snow pack in the northern Cascades, with Mt. Baker, Wash., setting a U.S. record for the most snowfall in a snow season (1,140 inches). The snow melt from this snow pack provided sufficient irrigation for crops as the conditions in the region turned very dry in the late spring and summer seasons.

Historical precipitation records for the United States show an annual increase of approximately 2.1 inches over the past 100 years.

The 1999 statistics, including regional and seasonal variations in the global pictures and global precipitation, can be found at:

<http://www.ncdc.noaa.gov/annual1999.html>

This is consistent with a long-term increase of 5 to 10 percent. However, 1999 was the first year since 1989 with an annual total (30.60 inches) below the long-term average of 31.65 inches, and is the driest year since the drought year of 1988. ■

Detailed descriptions of the 20th Century events, with corresponding weather technology sidebars and reproducible photos or satellite images for the U.S. events, are available on NOAA's Web site or by four-page fact sheet upon request to the NWS Public Affairs Office at (301) 713-0622.

NOAA releases century's top weather, water and climate events

The nation's climate and weather experts of the National Oceanic and Atmospheric Administration last month unveiled the top weather, water, and climate events of the 20th Century. Dozens of NOAA scientists contributed to a listing of U.S. and global storms and climate events noted for their atmospheric marvel or impact on human life.

In compiling the listing, NOAA climatologists, meteorologists and hydrologists had the difficult job of selecting a few of the world's most notable

tornadoes, floods, hurricanes, climate events and other weather phenomena that marked 20th Century weather. Some factors that were taken into consideration included an event's magnitude, meteorological uniqueness, as well as its economic impact and death toll. Some of America's best meteorological minds each brought a perspective based upon their area of expertise to advise on the compilation. ■

Top U.S. Weather/Water/Climate Events

(no particular order)

- Galveston Hurricane, 1900
- Dust Bowl, 1930s
- Super Tornado Outbreak, 1974
- Hurricane Camille, 1969
- The Great Midwest Flood, 1993
- El Niño Episodes, 1982-83 and 1997-98
- Hurricane Andrew, 1992
- New England Hurricane, 1938
- Superstorm, 1993
- Tri-state Tornado, 1925
- Oklahoma/Kansas Tornado Outbreak, 1999
- The Great Okeechobee Hurricane and Flood, 1928
- The Storm of the Century, 1950
- Florida Keys Hurricane, 1935
- New England Blizzard, 1978

Top Global Weather/Water/Climate Events

(no particular order)

- Yangtze River Flood, China, 1931
- North Vietnam Flood, 1971
- Great Iran Flood, 1954
- Bangladesh Cyclone, 1970
- Bangladesh Cyclone, 1991
- China Typhoons, 1912, 1922
- Hurricane Mitch, Honduras and Nicaragua, 1998
- Typhoon Vera, Japan, 1958
- Typhoon Thelma, Philippines, 1991
- Asian Droughts (India 1900, 1907, 1965-67; China 1907, 1928-30, 1936, 1941-42; and Soviet Union 1921-22)
- Sahel Drought, Africa, 1910-1914, 1940-44, 1970-85
- Iran Blizzard, 1972
- Europe Storm Surge, 1953
- Great Smog of London, 1952
- El Niño, 1982-83

Not on file: *Engineer Highlights*

Title: Manager, International Space Station Portable Computer Systems Software.

Time at JSC: 15 years.

Education: Texas A&M University, B.S. Electrical Engineering.

Favorite book or movie: Any Tom Clancy novel. For movies, *The Matrix* or *The Sixth Sense*.

Favorite music: Alternative.

When away from JSC: I like to work on my ham radio, play golf, or go hunting.

What you like about NASA...and your job at JSC: The people and the challenges of the projects make this a great place to work. Plus, NASA has a great legacy behind it and a great future we're building. What else can I say? I love what I do!

Background: Seeing a 6-year-old taking apart the phones and radios is always a tell-tale sign of a budding engineer. Nothing was truer of JSC's John Maca, who says he pretty much knew all along that he would do something with electronics when he grew up.

"I was always tinkering with things," explained Maca. "I nearly drove my parents crazy always taking stuff apart, but it always worked when I put it back together."

By 15, he had discovered the limitless world of ham radio through a neighbor and obtained an amateur radio operator's license. That teenage introduction sparked a passion that continues today and is what led him to pursue engineering in college.

"I wanted to go somewhere with a really strong engineering program" said Maca. "I asked several family friends what they recommended, including Gerry Griffin who was a flight director at the time. Being an Aggie himself, he recommended A&M."



NASA JSC Photo JSC-2000-00137 by James Blair

Name: John Maca

That was pretty much the consensus, so that's where I went."

Maca graduated in 1984 with an electrical engineering degree and joined the JSC team as a digital voice intercom systems engineer where he progressed to project manager. In 1990, he transitioned to the simulator development for the ISS training facility. In 1993, he spent about eight months on-loan to the Assured Crew Return Vehicle Project Office working training simulator issues. In 1996, he joined the Portable Computer Systems Project as a systems engineer.

"Those first positions gave me valuable experience and job diversity," said Maca. "But my early mentors also were important. Leroy Penn and C.W. Vowell were two people who 'took me under their wings' and provided invaluable guidance in my early days."

Now Maca leads a group of nearly 30 software engineers to develop the PCS software.

"PCS is very diverse and I get to do a lot of hands-on work and be directly involved with the development," said Maca.

Maca is responsible for production of the laptop software, including the different displays for every flight, and providing the software to ISS for command and control of the vehicle. However, like most positions, there's always a unique project that comes up. For Maca, it's working on the International Display and Graphics Standards Panel – a forum of representatives from all the IPs who define the official style and format for all ISS displays.

According to Linda Uljon, Maca's supervisor, he's a perfect match for such a role.

"He works hard and is open to new ideas and ways of improving things," said Uljon. "This attitude has been wonderful in negotiating commonality of laptop hardware and software with the Russians. They have come to trust that he will consider their ideas on an equal footing with NASA ideas, and work to provide the best common solution."

Maca finds satisfaction in being part of the project.

"It's neat creating a standard," said Maca. "This one in particular because it entails negotiating with the international community to agree on numerous icons, symbols and methods. It's quite an accomplishment and I understand there are outside agencies interested in it."

You can imagine the hundreds of icons, colors, fonts, sizes and layout methods that have to be determined and agreed upon. It can be challenging, but it does have its perks.

"Getting to work so closely with the astronaut crew is really a neat part of the job," he said. "There are some really dedicated and brilliant people to work with."

Maca still remains very active with his amateur radio hobby. Aside from being the station manager for the JSC Amateur Radio Club and past president of the Clear Lake Amateur Radio Club, Maca also serves as an amateur radio volunteer examiner, working with local Boy Scout troops and other groups to introduce them to the world of radio technology.

"It's rewarding that you may have sparked an interest in ham radio and maybe even increased their interest in science in general," said Maca. "It's fun when parents bring their kids out and, after showing them briefly how to operate the radio and what to say, seeing them get all excited when they make their first contact with a person in another state or country. That's priceless." ■

Title: Russian Training Integration Instructor.

Time at JSC: Eight years with the space program including four within crew training.

Education: University of Texas, B.S. Aerospace Engineering and a B.A. in Plan II Honors (an honors liberal arts program).

Favorite book or movie: My favorite movie is *Bringing Up Baby* with Kathryn Hepburn, Cary Grant, and a leopard named Baby because it's a good, off-the-wall comedy. *Snowcrash* by Neil Stephenson is my favorite book because it's so radically different and energetic.

Favorite music: Darden Smith and Elvis Costello.

When away from JSC: I enjoy reading. It annoys my wife sometimes how fast I can turn through books. I'll go through two or three on one plane ride to Moscow.

What you like about NASA...and your job at JSC: The challenge of it all – my everyday job is to learn how things work, which has always been something that I enjoy.

Background: Although many people would consider international travel as a perk to any job, meeting your spouse while overseas has got to top the list of fringe benefits.

Such is the case for Chris Niemann. As a Russian training integration instructor, the 31-year-old has spent more than half his time during the past two years living in Russia, and has readily adapted to a schedule packed with visits to the cosmonaut training center at Star City. Niemann had studied Russian in college, so he already had a good grasp of the language when he met Natasha Doroshenko, a Russian native serving as an



NASA JSC Photo JSC-2000-00962 by James Blair

Name: Chris Niemann

office manager/translator for the Director of Operations – Russia office in Star City.

Niemann mixes well with most Russians, but this one was special. He and Natasha were married this past summer and are expecting twins this March. As Niemann's primary project is supporting crew training for the Expedition 1 and 3 missions, he continues to spend the majority of his time in Russia, where Natasha and her 8-year-old daughter, Olga, still live.

"It's been a wonderful experience," says Niemann. "I've always enjoyed my job in Russia."

Niemann says that building personal rapport with the Russians is an integral part of working with them.

"It is a totally different culture," says Niemann. "Relationships are how you get

things done in Russia. Job titles, especially at the lower levels, don't have the same initial impact that they have here. You have to earn the respect of each individual if you want cooperation."

Niemann explains there are understood traditions in Russia for building team camaraderie.

"It is different how you socially interact there," said Niemann. "You are expected to share with them outside of work occasionally, and that may mean a throw-together feast of black bread, vodka, sliced meats and pickles after work. They get to know you, you get to know them, and after that, you see a willingness and a flexibility from them that you haven't seen before."

Establishing successful relationships with the Russians is only part of Niemann's job.

The core of his position revolves around the U.S. flight crewmembers, ensuring their mission training is concise, relevant and valuable. The training and preparation for Expeditions One through Four can be intense and problematic, and crewmembers long ago recognized the value of having advocates to help streamline the workload – especially in Russia. As a trial run, four Russian integration instructors are now permanently assigned to the crews and oversee all aspects of their training.

"To know that you have something you can teach astronauts or flight controllers is a good feeling," said Niemann, who says an average day might entail reviewing and editing Russian system schematics, negotiating the content of lessons with Russian instructors, bringing crew operational issues to the attention of the proper boards, and reviewing a system with a crew in preparation for exams.

Niemann feels it takes patience, flexibility and perseverance to be successful in this role.

"In this project, you have to expect everything is going to change underneath you continuously," explained Niemann. "You won't always get results the first time, but you must be ready to try again and again, if necessary. You can't let things get to you in this job."

It's that calm approach that Niemann's supervisors think contribute so much to his success.

William O'Keefe, the Motion Control lead and Niemann's supervisor for the past four years, agrees. "Stress apparently doesn't affect him," said O'Keefe, "his pulse never gets above 50. He has an outstanding ability to understand extremely complex technical material and the ability to do the work of three people. From him, I realize that 'low key' and high performance are not mutually exclusive." ■

PEOPLE *on the* **MOVE**

Human Resources reports the following personnel changes:

Key Management Assignments

Jeanie Carter was named chief information officer.

Additions to the Workforce

Jessica Lally joins the Projects Procurement Office, Office of Procurement, as a contract specialist.

Joey Broome joins the Advanced Mission Design Branch, Aeroscience and Flight Mechanics Division, Engineering Directorate, as a design engineer.

Edgar Medina joins the Guidance, Navigation, and Control Design and Analysis Branch, Aeroscience and Flight Mechanics Division, Engineering Directorate, as a design engineer.

Jason Dake joins the EVA and IVA Equipment Branch, Crew and Thermal Systems Division, Engineering Directorate, as a test engineer.

John Feighery joins the Life Support and Habitability Systems Branch, Crew and Thermal Systems Division, Engineering Directorate, as a test engineer.

Promotions

Lindy Fortenberry was selected as a management analyst in the International Space Station Business Management/Commercialization Office, Space Station Program Office.

Linda Crotts was selected as senior secretary in the Legal Office.

Mary O'Connell was selected as exchange operations special assistant in the Human Resources Office.

Reassignments Between Directorates

Camille Wilson moves from the International Space Station Program Office to the Public Affairs Office.

Larry Moon moves from the International Space Station Program Office to the Engineering Directorate.

Laversa Owens-Taylor moves from the Engineering Directorate to the Space Shuttle Program Office.

Trish Petete moves from the Engineering Directorate to the Space Shuttle Program Office.

Rick Schmidgall moves from the Mission Operations Directorate to the Space Shuttle Program Office.

Bill Jordan moves from the Space Shuttle Program Office to the International Space Station Program Office.

Reassignments Between Centers

Anna Henderson moves to NASA Headquarters.

Retirements

Jack Garman and *John Arnold* of the Office of the Chief Information Officer.

Gary Kane of the Systems Management Office.

Johnnie Kemp of the Legal Office.

Boyd Mounce and *Pat Malpass* of the Public Affairs Office.

James Bagwell, *Lew Casey*, *Wally Tuthill*, *Charles Verostko*, and *William Wood* of the Engineering Directorate.

Cathy Lamb of the Office of the Chief Financial Officer.

Robert Kain and *Richard Sims* of the Space Shuttle Program Office.

Dot Childress of the International Space Station Program Office.

Charles Bourland, *Walter Hanby*, *James Lewis*, *Richard Sauer*, and *Laurie Webster* of the Space and Life Sciences Directorate.

Resignations

Kellye Welch of the Office of Procurement.

Don McMonagle of the Space Shuttle Program Office.

Nelda Howell of the Safety, Reliability, and Quality Assurance Office.

Stephen Hunter of the International Space Station Program Office.

DATES & DATA

February 11

Astronomers meet: The JSC Astronomical Society will meet at 7:30 p.m. at the Center for Advanced Space Studies, 3600 Bay Area Blvd. For more information call Chuck Shaw at x35416.

February 13

Westside NSS meets: The "Westside" group of the Clear Lake area chapter of the National Space Society will meet at 2 p.m. at Silicon Graphics, 11490 Westheimer, Suite 100. For additional information call Murray Clark at (281) 367-2227.

February 15

AIAA meets: Johnny Conkin, Ph.D., will discuss "Protection Against Decompression Sickness on Mars" at AIAA's "Lunch & Learn" at 11:30 a.m. in Bldg. 37, Conference Room 2. For more information and reservations contact Karin Loftin at x41122.

February 16

Astronomy seminar: The JSC Astronomy Seminar Club will meet at noon February 16 and 23 and March 1 and 8 in Bldg. 31, Rm. 248A. For more information call Al Jackson at x35037.

Spaceteam Toastmasters meet: The Spaceteam Toastmasters will meet at 11:30 a.m. February 16 and 23 and March 1 and 8 at United Space Alliance, 600 Gemini. For more information, call Patricia Blackwell at (281) 280-6863.

Scuba club meets: The Lunarins will meet at 7:30 p.m. For additional information call Mike Manering at x32618.

February 17

Communicators meet: The Clear Lake Communicators, a Toastmaster International club, will meet February 17 and 24 at 11:30 a.m. Please note the new meeting location at Wyle Laboratories, 1100 Hercules, Suite 305. For details contact Allen Prescott at (281) 282-3281 or Richard Lehman at (281) 280-6557.

Directors meet: The Space Family Education board of directors will meet at 11:30 a.m. in Bldg. 45, Rm. 712D. For more information contact Lynn Buquo at x34716.

February 24

Radio Club meets: The JSC Amateur Radio Club will meet at 6:30 p.m. at the Piccadilly, 2465 Bay Area Blvd. For additional information contact Larry Dietrich at x39198.

February 28

Alzheimer's support group meets: The Clear Lake Alzheimer's Caregiver Support Group will meet at 7:30 p.m. in the first floor conference room, St. John Hospital West building, Nassau Bay. For more information contact Nancy Malley at (281) 480-8917 or John Gouveia (281) 280-8517.

March 9

SSQ meets: The Society for Software Quality presents "Licensure as a Professional Engineer in Software Engineering" by Dr. Chuck Hoffman of Barrios Technology. The brown bag will be at noon at Barrios Technology conference room, 2525 Bay Area Blvd., Suite 300. R.S.V.P. by March 6 to Renne Peterson (281) 282-4392.

NASA BRIEFS

LONE BLACK HOLES DISCOVERED ADRIFT IN GALAXY

Two international teams of astronomers using NASA's Hubble Space Telescope and ground-based telescopes in Australia and Chile have discovered the first examples of isolated stellar-mass black holes adrift among the stars in our galaxy.

All previously known stellar black holes have been found in orbit around normal stars, with their presence determined by their effect on the companion star. The two isolated black holes were detected indirectly by the way their extreme gravity bends the light from a more distant star behind them.

"These results suggest that black holes are common, and that many massive but normal stars may end their lives as black holes instead of as neutron stars," said David Bennett of the University of Notre Dame, South Bend, IN. Bennett presented his team's results in Atlanta at the 195th meeting of the American Astronomical Society.

The findings also suggest that stellar mass black holes do not require some sort of interaction in a double star system to form, but may also be produced in the collapse of isolated massive stars, as has long been proposed by stellar theorists.

CHANDRA RESOLVES X-RAY GLOW INTO MILLIONS OF OBJECTS

While taking a giant leap toward solving one of the greatest mysteries of astronomy, NASA's Chandra X-ray Observatory also may have revealed the most distant objects ever seen in the universe and discovered two puzzling new types of cosmic objects.

Not bad for being on the job only five months.

Chandra has resolved most of the X-ray background, a pervasive glow of X-rays throughout the universe, which was first discovered in the early days of space exploration. Before now, scientists have not been able to discern the origin of the hard, or high-energy, X-ray background, because until Chandra no telescope has had the technology to resolve it.

"This is a major discovery," said Dr. Alan Bunner, director of NASA's Structure and Evolution of the Universe science theme. "Since it was first observed 37 years ago, understanding the source of the X-ray background has been a Holy Grail of X-ray astronomy. Now, it is within reach."

The Chandra team looked at a small section of the sky, a circle about one-fifth the size of a full moon, and resolved about 80 percent of the X-ray glow in this region into specific light sources. Stretched across the entire sky, this adds up to approximately 70 million sources, most of which are galaxies.

One-third of the sources are galaxies whose cores shine bright in X-rays, yet do not shine in visible light. There may be tens of millions of these "veiled galactic nuclei" in the universe. Each of these galaxies likely harbors a massive black hole at its core that produces X-rays as gas is pulled toward it at nearly the speed of light.

A second new class of objects, comprising approximately one-third of the sources, is assumed to be "ultra-faint galaxies." These sources may emit little or no optical light.

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EditorWilliam Jeffswilliam.p.jeffs@jsc.nasa.gov
Assistant EditorNicole Cloutierncloutie@ems.jsc.nasa.gov

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